tion, large quantities of a dead coral skeleton, apparently allied to Corallium, which was blackened by that substance. It is in the hope of eliciting some definite information from the readers of NATURE concerning the so-called Japanese Corallium that I send the present notes. At a late meeting of the Zoological Society, Mr. G. O. Ridley, of the British Museum, read a paper on the Coraliidæ, and reviewed the species known, and exhibited specimens of the form said to come from Japan. I obtained specimens of this corallium from Mr. Cutter, the London dealer, from whom I first learned that a precious coral was called Japanese. He told me that he had seen a large quantity in the market in London, but that it would not fetch any price, whereas Messrs. Greck state that Japanese coral sold for an extremely high price in Italy. Messrs. Phillips, of Cockspur Street, who also exhibited a fine series of specimens of precious coral at one of my lectures, showed amongst them a carved jewel cut out of Japanese coral, which is remarkable as being of mixed colour, marbled white and red, and also, as they informed me, for its far greater hardness than ordinary precious coral.

Now although this coral, which is of a named species, is evidently universally regarded in the trade as Japanese, all evidence available seems to prove that no precious coral occurs in Japan. The *Challenger* did not meet with any; and though I inquired, I heard of none as dredged there. Moreover, in numerous Japanese illustrated works on the races of men, certain foreigners of some kind are represented as bearing in their hands precious coral as tribute, or as the staple produce of their country, thus showing apparently that the coral is regarded as something rare from abroad in Japan. Perhaps, some of the correspondents of NATURE in Japan can state whether any corallium occurs in Japanese waters. H. N. MOSELEY

Extract from the letter of Messrs. Greck and Co.:—

"Coral fisheries on the coasts of Italy and Sicily begin about the middle of February, and continue till the middle of October. The value of the coral fished up varies immensely according to its colour and size; the pale pink is the most prized, especially if it be of a uniform colour throughout, without stains. Off Torre del Greco, near Naples, a large quantity of coral is found every year; from 400 to 600 boats are sent out in search of it, each boat being of from six to ten tons' burden, with a crew of at least twelve men, and costing from 500*l.* to 600*l.* a boat. Nearly all the inhabitants of Torre del Greco are employed by this industry, either as fishermen or in the manufacture of the coral brought to shore. The valuable pink coral is found chiefly off the coast of Sicily: in the year 1873 a bed was discovered in the Straits of Messina, in which the coral, though found only in small quantities and of a small size, was of immense value, owing to its beautiful pink, of a uniform colour, and without any of those stains which detract so much from its worth. The coral found in this place is sent chiefly to London and Birmingham; it is usually manufactured in the shape of 'lentils,' and in this form is largely used for rings, either set singly in half-hoops or surrounded by precious stones and pearls. Its value varies from 80*l.* to upwards of 200*l.* per ounce.

"Unfortunately the supply of coral in this bed seems to have run short, and for the last few years coral-merchants have not found it worth their while to send boats in search of it. The last attempt was made last year by the firms of Criscuolo and Greck and Co., who despatched two boats with a crew of thirty selected men, but the find was so small as barely to pay the expenses of the outfit.

"This year out of 800 boats employed in the coral-fishery off the coast of Sicily, not one has been sent to the bed in the Straits of Messina. In 1875 a local bed was discovered about twenty miles off the coast of Sciacca in Sicily, which was invaded for the next two years by 700 boats. This number of boats all crowded together in one spot, caused great confusion, and the Italian Government despatched a man of war to keep order among the fishermen. Another similar bed was discovered in 1878, about ten miles further from the coast, and in 1880 yet another still further, to which 600 boats were sent, and we learn from the reports of the Custom House at Sciacca that in a few months about 8000 tons were fished, and although the quality of the coral is very inferior, being of a reddish colour and often quite black, its value is computed at several millions of pounds. The coral found off the coast of Sciacca does not grow as at other places attached to rocks, but is found clinging to any small object it can lay hold of, such as a shell, or a fragment of coral. It is supposed that its dark red or black colour is caused by the muddiness of the water in which it lives, although the depth of the sea at such spots is from 300 to 450 feet. This coral is not much esteemed in the English market, but is prepared in large quantities for the Indian market at Calcutta, by being exposed for months to the heat of the sun, and by being kept moist, when in time the black colour gradually disappears.

"A few years ago a large quantity of Japanese coral found its way into the market at Naples, and fetched as much as 150*l.* the kilo. in raw branches, in spite of its being a bad colour and somewhat cloudy. This high price was given on account of its extraordinary size. It is the largest real coral ever known. Nothing has been heard of it since, excepting that the fishery was prohibited in Japan."

MAXIM'S SELF-ACTING FIRE-EXTINGUISHERS[1]

HOWEVER certain it is that fires in theatres will never be completely suppressed, we may still hope by energetic measures and systematic arrangements to lessen both their number and their danger, and it is scarcely probable that we shall ever again have to record such a catastrophe as that of the theatre at Nice or the Ring Theatre at Vienna. The preventive measures to be taken against a dangerous fire which may break forth at any moment are twofold—moral and material. The moral measures unfortunately do not admit of immediate or easy application. The public must be educated, and, as it were, familiarised with the danger, by being shown the precautions taken, the most direct escape available in case of fire, so as to avoid or rather diminish the terrible results due to the crush of a mass of frantic people precipitating themselves at the same moment into the outlets during the frightful struggle for life which accompanies the slightest panic. In short, the instinct of self-preservation must be so methodised as to be rendered most efficacious. Lamps, notices to indicate the way out, widening the passages and corridors, increasing the number of outlets and staircases, &c., are all useful measures which are now being actively carried out.

In addition to these measures, whose special object is to lessen the number of victims, when it is impossible to stay the progress of the fire, there are others directed against the fire itself, by checking its advance, or strangling it, as it were, in its very birth. The stage is undoubtedly the most dangerous point, from the very nature of the materials composing it. With the decorations constantly exposed to blazing jets, it seems miraculous that accidents are not more frequent, and it is therefore upon the stage principally that the measures for fire-extinction are to be brought to bear; it is also important that they act instantly; for it is always more easy to obtain the mastery over a fire towards its commencement, before it has had time to develop into an incurable evil. The remedy, moreover, will often come too late, if its application depends on those who are on the stage, because they themselves, frequently under the influence of premature panic, or being too remote from the point attacked by the fire, reach it only too late to arrest its progress.

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[1] From *La Nature*.

Under those circumstances M. Maxim thought it advisable to make use of *self-acting* measures; and for that purpose has formed a combination of very ingenious appliances, the principle of which he now proposes to explain.

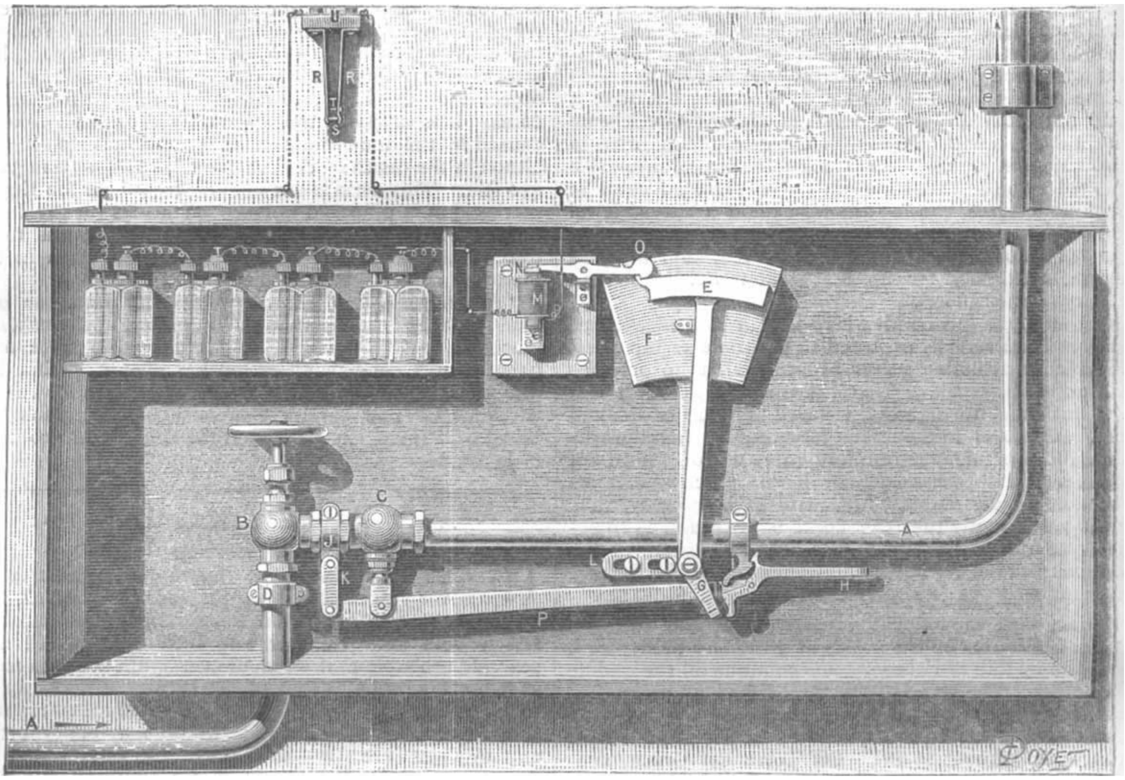

FIG. 1.—Apparatus closing the circuit and opening the tap.

M. Maxim's proposal is to institute such a preventive system that, as soon as a fire begins to show itself at any given point of the stage, the accident will itself produce automatically and instantaneously a series of mechanical movements sufficient to flood the threatened part with water, and arrest the progress of the fire. These movements are produced either by the mechanical action of levers, or by electricity; and we proceed to examine the two systems separately.

Mechanical System.—The part over the stage, and the spaces beneath it, the side-wings, and the ceiling-decorations, are traversed by a network of pipes of different diameters suitably distributed. These pipes are all connected with a common pipe in communication with the main water-supply of the town. In the usual condition, the system of pipes about the stage is full of air slightly compressed, and the supply-cock is closed. At regular intervals cocks are placed on the pipes and kept also closed by means of small levers, each of which is held in position by a string drawn tight, and fastened to a point at a suitable distance from the corresponding escape-cock. As soon as the fire shows itself at any given point, by the burning of one or more of the strings, the levers are set free, and thus open the corresponding escape-cock, and allow the compressed air to escape from the system of pipes. This depression of the compressed air lowers a valve, which sets free a weight acting on the supply-cock. The latter being thus opened, the water from the main passes throughout the system of pipes, and is at once discharged by the openings corresponding to the strings which have been burned. Thanks to this arrangement, a simple movement, caused by the rupture of a combustible string, is sufficient to act upon all the discharge-cocks, flood the part which is in danger, and prevent the fire from spreading.

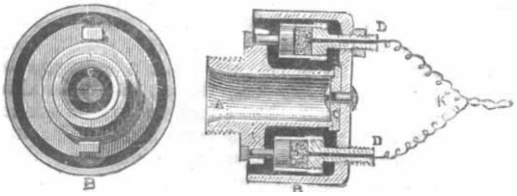

FIG. 2.—Opening of a pipe by burning a string.

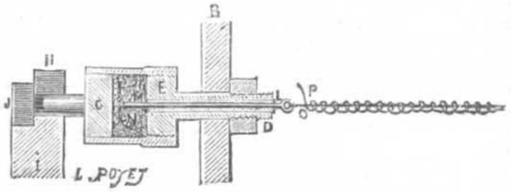

FIG. 3.—Opening of a pipe by the passage of a current of electricity.

To cause a discharge of water at any given point, M. Maxim also makes use of short combustible strings, so hanging, that when set on fire they cause an explosion of a little gun-cotton placed in a sortyof a cap, which shuts the mouth of the discharge-pipe. The cap being blown off, the air escapes, and thus, by the arrangements already described, the water discharges by the opening made by the explosion. This string-arrangement, however, is not free from objections. In scene-shifting, for example, some of the strings might be broken, opening the discharge-cocks, and thus flooding the men employed, and causing a false alarm and useless waste. That objection is entirely avoided by the electric system.

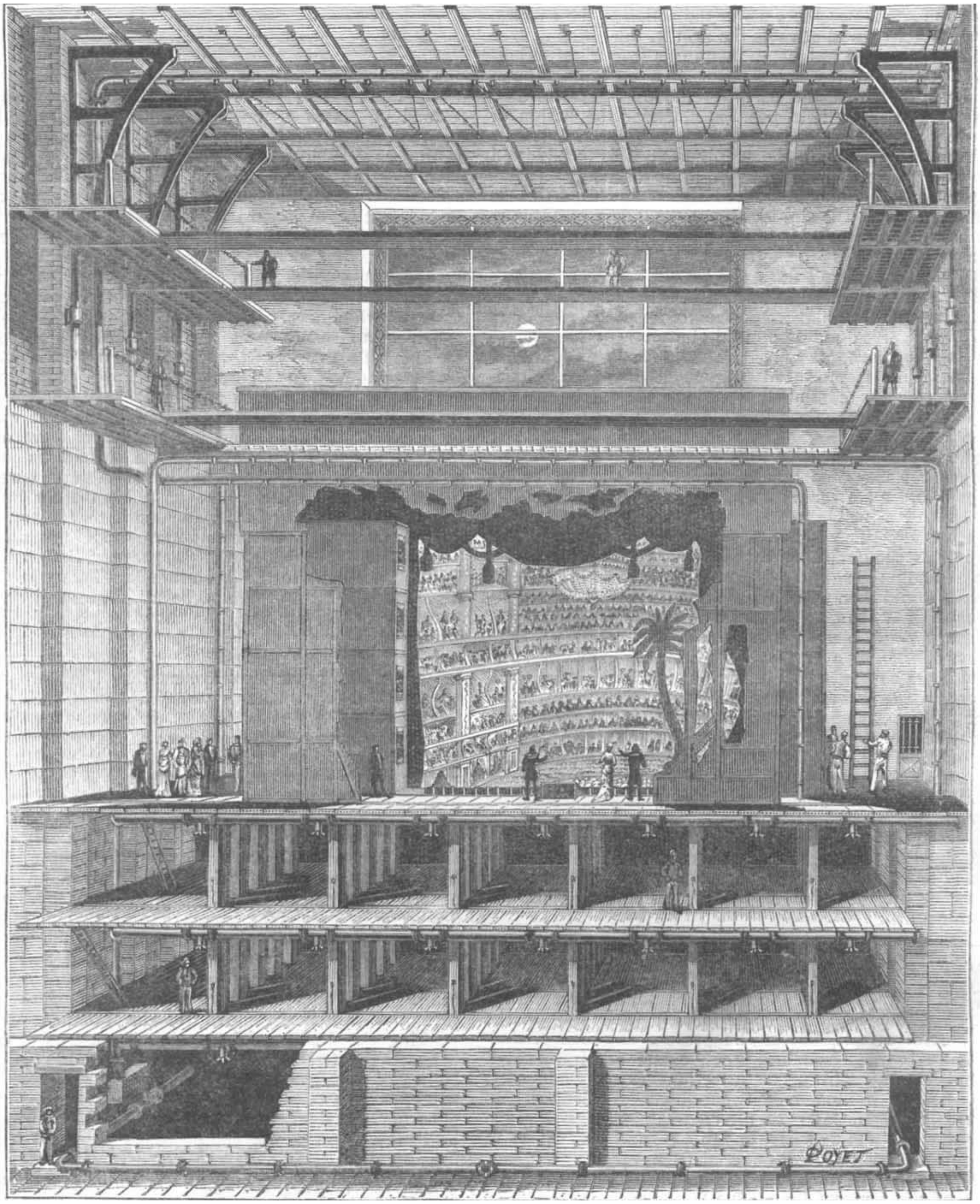

FIG. 4.—Arrangement of system of pipes above and below the stage.

Electric System.—In this self-acting extinguishing apparatus, the network of pipes is the same as in the mechanical system, but they are not filled with compressed air. The system, as a whole, is composed of three distinct parts:—(1) an apparatus which completes the electric circuit, under the action of the raising of temperature caused by the fire; (2) a self-acting supply-cock, to send water into the system of pipes from the main pipe in the street; (3) an arrangement for opening the discharge-pipes upon any part which is in danger.

The apparatus (1) for completing the electric circuit is extremely simple. It is composed (Fig. 1) of two metallic plates, R, R, forming springs, and separated by a small piece of fusible metal, S, which is isolated from the plates by paper, or any other isolating body. The heat caused by the fire melts the metal, and the plates coming into contact, the electric acts upon the automatic supply-cock. This self-acting supply-cock (Fig. 1) is composed of an electro-magnet, M, which, under the action of the current, becomes active, and attracts the arm N, thus setting free the lever, E. The weight, F, then turns from right to left, and, after describing the quarter of a circle, falls upon the lever, H, whilst the part, G, removes a check which has kept the lever, P, in position. Under the action of the weight, F, and by means of the lever, P, which has its fulcrum in the point, J, the supply-cock, C, is turned, and the water rushes into the pipe, A, to be discharged above. The cock at B, which is worked by hand, serves to stop the supply when the fire is extinguished, or when repairs are being made. Under ordinary circumstances, it must be always open, else the action of the automatic supply-cock would be of no effect.

The water pouring upwards into the pipes ought to be discharged at the point where the fire appears. Ordinary perforated pipes may be used, but it is preferable to localise the discharge of water by the explosion of gun-cotton. This is produced (Fig. 2) either by the inflammation of very combustible strings K, which set fire through D to some gun-cotton placed in the small pistons B; or electrically (Fig. 3) by a fine platinum wire N being rendered incandescent by the current, and thus exploding the gun-cotton. For this purpose the two conducting wires O and P are separated by an insulating combustible matter and a fusible conductor, resembling those of M. Charpentier. The increase of temperature accordingly completes the circuit and causes the explosion. When there is no public supply of water, as in small towns, M. Maxim would then utilise the electric current as follows:—The weight F (Fig. 1) when set free falls on a bottle of sulphuric acid placed over a reservoir half filled with water, containing a certain proportion of lime. A large quantity of carbonic acid being thus produced in a closed reservoir, the pressure forces the water inio the system of pipes. Fig. 4, the section of a large theatre, shows how the system of pipes may be disposed around the stage. Such, substantially, are the principles of M. Maxim's apparatus for preventing fires in theatres and places where people assemble in numbers, such as large warehouses, hotels, &c.

Taking the most impartial view of the advantages to be gained by this apparatus, we hope it will soon be submitted to the test of experience, while desiring there may never be any occasion of making its effectiveness too prominent.

ART METAL WORK OF JAPAN

FOR centuries past the artists of Japan have earned for themselves a reputation for their skill in the working of metals, and at the present day their productions in bronze, iron and steel, excite admiration and astonishment. This art industry is of extreme antiquity. Mr. Satow, in his recent handbook of Central and Northern Japan, describes the colossal image of Buddha at Nara It was first cast in 749 A.D., and was set up in its present position. It suffered from various accidents, and in 1567 the temple was burned to the ground, the head of the image falling off. It was replaced not long afterwards, and we may therefore assign to the body an age of 1140 years, and to the head about 300 years. Buddha is represented seated cross-legged on a dais which is of bronze, and represents the calyx of a lotus. The figure is 53½ feet high; the face is 16 feet long, and 9½ wide, while 966 curls adorn the head, around which is a halo 78 feet in diameter, on which are images 8 feet in length. A roof protects the image, and a staging is erected to assist visitors in examining it. The casting is said to have been attempted seven times before it was accomplished, and 3000 tons of charcoal were used in the operation. The whole is said to weigh 450 tons, and the alloy is composed of:—

Gold	500 lbs.
Mercury	1,954 ,,
Tin	16,827 ,,
Copper	986,080 ,,

"The body of the image and all the most ancient part of the lotus flowers on which it is seated are apparently formed of plates of bronze 10 inches by 12, soldered together, except the modern parts, which are much larger castings. A peculiar method of construction is said to have been adopted, namely, of gradually building up the walls of the mould as the lower part of the casting cooled, instead of constructing the whole mould first, and then making the casting in a single piece." The other large image of Dai Butsu at Kamakura, near Yokohama, is somewhat smaller than this, and dates from a period three centuries more recent. The various temple bells, some of which are of great size, are remarkable for the sweetness and mellowness of their tones, which contrast greatly with the harsh, clanging sounds to which we are accustomed in Europe. They are struck on the outside by huge pine beams which are suspended by strong ropes. The vessels ordinarily used in worship, such as vases, lamps, and incense-burners, are also of bronze, many of them being fine specimens of art, executed in high relief, and finished with much care. The demand for art metal work of a high order has thus existed for centuries in Japan; and so far as can be judged from the specimens of more modern work of this description, the hand of the Japanese workman has not lost its cunning. In the Japanese Art-Gallery in Grafton Street, among many rare and beautiful productions of the Land of the Rising Sun, the metal work well deserves attention. A pair of dark green-tinted bronze vases, fourteen inches high, inlaid with gold, are conspicuous for beauty of design and workmanship. They are said to have occupied the maker seven years, and their curious tint is said to be a trade secret. It must be understood that it is no mere surface colouring, but is produced by the mixture of the metals in certain proportions. The work on the rims and necks represent in gold inlay a cloud dragon, while the bodies are decorated with four medallions formed of gold and silver inlays, the shading obtained by an inlay of gold upon silver being very remarkable. The tints of bronzes vary in colour and depth from yellow, green, and ruddy to dark brown, and next to beauty of design, the tint is a *sine quâ non*. A favourite design on bronzes is the dragon, a subject which is treated with much force and character.

A plaque of *Shakudo*—an alloy of gold and copper, and black in colour—set in a bronze mounting, representing the bamboo, is remarkable as showing the care and labour expended by the Japanese artist in working out details. The design represents a meeting between the twelve chief disciples of Buddha; the inlaying of the figures, trees, flowers, &c., is of gold and silver, with various tinted compositions, and stands out from the dark background of the alloy with much brilliancy. One of the compositions employed for shading is called *shibu-ichi*, and consists of three parts of copper to one of silver. Both these alloys are favourite compositions of the Japanese artist. The minute interlaying of gold and silver in another plaque, about eighteen inches in diameter, with a curvilinear border, exhibits marvellous skill. The body of the plaque is of iron, and the border is adorned with grape-leaf and fruit patterns, the former being of gold, the latter of silver. This is the work of Komai, of Kioto, whose family held the office of sword-mounters to the Court. Swords in the olden time